CHAPTER 5

WALKS, STEPS, AND RAMPS

5-1. Applicability. Walks, steps, and ramps provide for convenient and safe pedestrian access and circulation from parking areas, to comfort stations, bathhouses and other facilities as needed. Walks, steps, and ramps also, where it is desirable, channelize pedestrian traffic, and protect relatively fragile environments from damage by foot traffic. Walks, steps and ramps should serve the handicapped visitor as required. Not all outdoor recreation areas and facilities will be amenable to providing ramping in lieu of steps. However every effort should be made to make representive parts of recreation areas accessible to all users. Walks and ramps can usually, when studied with knowledge of existing topography, make representive parts of a area accessible.

5-2. Controls.

a. Function. Function establishes the need for walks, steps, and ramps and controls the width, layout and materials.

b. Climate. This affects the need for walks (the need being greater in humid climates), grade, drainage and materials. Icing affects grades and may make canopies necessary over ramps and steps in walks at entrances to buildings.

c. Preservation of Environmental Values. Construction of walks detracts from the natural appearance of a site or area. On the other hand, construction of walks tends to channelize pedestrian traffic so that widespread damage to ground cover and soil compaction is decreased. Environmental considerations influence good design of grade, alignment and aesthetics of walks. Examples: In desert areas where ground cover is sparse and the ground is not too rough, walks may not be needed. In areas where ground cover is lush and can stand a great deal of foot traffic, walks may not be needed for some facilities.

d. Topography and Physical Features. These considerations affect walk design in much the same way that they affect road design. Layout, grade, drainage and erosion control will be heavily influenced by topography and physical features. The need for steps and/or ramps in walks is dictated by terrain and the using public. Alignment may be affected by the need to route walks around rather than through desirable features.

e. Constructability and Maintainability. These controls impact most heavily on materials, grades, drainage and erosion control measures.

f. Safety. The safety of visitors should be of uppermost concern. Safety considerations must be incorporated into the design of grade, surface, drainage, location, width, steps, ramps, guards, handrails, lighting and all other features of design.

5-3. Physically Handicapped. Each recreation area offers a different challenge to the designer to provide access for the handicapped. Handicapped needs should be identified in the early stages of design so that facilities may be provided as the need warrents. It will usually not be possible to make each recreation facility, i.e., picnic unit, camping unit, or trail accessible to the physically handicapped; however, a sufficient number should be made accessible with similar freedom of choice as non-handicapped visitors. More specific information on which and how many recreation facilities are to be provided for handicapped use is furnished and will be periodically updated in the Manual on Design for the Physically Handicapped. In addition design criteria for walks, ramps, guards, handrails, etc., can be found in that manual. Guidance to designers of outdoor recreation facilities for the handicapped can only be generalized because the limitations of handicapped visitors is highly variable. Some handicapped recreationist with only slight disabilities can in fact use many recreation facilities without modifications. On the other hand, facilities for the visitor in a wheel chair may require extensive adjustments.

5-4. Design Considerations. Walks, steps, and ramps for outdoor recreation areas should be designed in accordance with standards in the following subparagraphs.

a. Walks.

(1) Width. Pedestrian lanes are considered to be 2 feet wide. Walks with low traffic such as to individual picnic or camp sites should be 2 feet wide. Walks with moderate traffic (i.e. from parking area to facilities), and this will cover the majority of walks, should be 4 feet wide. Walks with heavy traffic (i.e. visitor centers) may be increased in width by multiples of 2 feet based on traffic analysis and design judgement to provide 6 feet, 8 feet, etc., widths. Figure 5-1 illustrates walk design adjacent to parking facilities.

(2) Location and layout. A general rule for walk design which should be observed to the extent feasible is that pedestrian and vehicular traffic should be separated. The location and layout of walks should be based on an analysis of facilities to be served, traffic, terrain, and physical features so as to best serve the public. Directness of route is of primary importance; otherwise, people will make cuts using shorter routes. Hesitant designers have often thought that it

would be ideal if walk construction could be deferred until after recreation facilities are in use and then built where people have established paths. In some instances, it may be necessary to place walks adjacent to roads. Walks adjacent to recreation access roads should be located well back of ditch lines, guideposts, and guardrails. Where there is no ditch or fill of consequence, the maximum distance available should be allowed between the walk and the outside edge of the road. Circulation roads, can sometimes be use for pedestrians as well as vehicles particularly in campgrounds. Vehicle speed should be posted at 15 mph. For aesthetic, purposes, long walks should usually be designed

Figure 5-1 Walk adjacent to parking area

with curvilinear alignment. However, the use of curving alignment should not unduly increase the length of a walk from point to point. Right angle turns in walks, except very short ones, will almost always be shortcut. Where right angle changes in walk direction must be used a fillet of three feet minimum radius should be constructed on the inside of the turn. Walks through wooded areas should be routed so as to

obviate removal of or damage desirable trees. Limbs overhanging walks should be pruned no more than to provide a horizontal clearance of 1' from the edge of walks and 7' vertical clearance above walks. It should be kept in mind that a walk system that looks great on paper may not be so on the ground. Accordingly, the design should usually be staked out and checked in the field before construction begins.

(3) Grade. The grade of walks should follow the natural grade of the ground as nearly as possible. The finished grade adjacent to walks should be 1 inch below walk grade to allow for turf growth. A transverse slope of 1/4 inch per foot should be provided for drainage. Longitudinal grades should not be greater than 10 percent in locales where there will be significant use during freezing weather, or 15 percent in non-freezing locales. Steps in walks are generally undesirable but should be used where longitudinal grades exceed 15 percent. Transverse grade of ground adjacent to walk edges should not exceed 25 percent for the first 3 feet unless handrails are provided. Walks along the foot of steep cut banks should be set out from the cut bank a distance of not less than 5 feet to provide safety from possible rock slides.

(4) Surface.

(a) Asphalt concrete. Surface thickness should be a minimum of 1 inch and a base course of 2-1/2 inches to 5 inches depending on soil conditions.

(b) Portland cement concrete. The concrete surface should be a minimum of 4" with a strength of 3000-3500 pounds. For most sites a leveling course of gravel or sand should be provided, the thickness of which should be determined on the basis of soil conditions.

(5) Drainage structures. Frequently walks must cross drainage courses and it will be necessary to provide drainage structures to pass the water under the walk. For small runoff rates pipe culverts are most suitable. Where head height is limited a battery of pipe culverts may be used. Metal arch pipes reduce head height requirements. Small reinforced concrete box culverts may be used instead of pipe culverts if cost is competitive and appearance is improved. Masonry or timber culverts may similarly be used. Culvert ends should be covered and extended for 3 feet from the edge of the walk for safety. For larger drainage courses foot bridges should be used.

b. Steps. When steps are used they should be grouped together, rather than spaced as individual steps. Not less than three risers should be used per group of steps. Ramping should be applied to grade changes requiring fewer than three risers. All step groups should be provided with handrails. Risers should normally be 5 inches and tread width 14 inches. When all steps are to be used frequently in nighttime hours, lighting should be included in the design. Steps should be built into the slope and have a foundation that goes below frost level. They may be constructed of various material, such as stone, brick, concrete, and wood or a combination of these.

c. Ramps. Ramps in walks should be used in lieu of steps in recreation areas for safety of visitors when the extent of change in elevation will permit. The maximum slope for ramping is 20 degrees, 15 degrees is the preferred maximum. Positive drainage should be provided transverse by tilting the ramp wearing surface on a 1 percent slope to the downhill side of the walk. Ramps should be protected from surface drainage which could cause deterioration of the ramp or its foundation. The design criteria for ramps, guards and handrails for the handicapped is given in manual for design for the pysically handicapped. A use of ramps for access is shown in Figure 5-2.

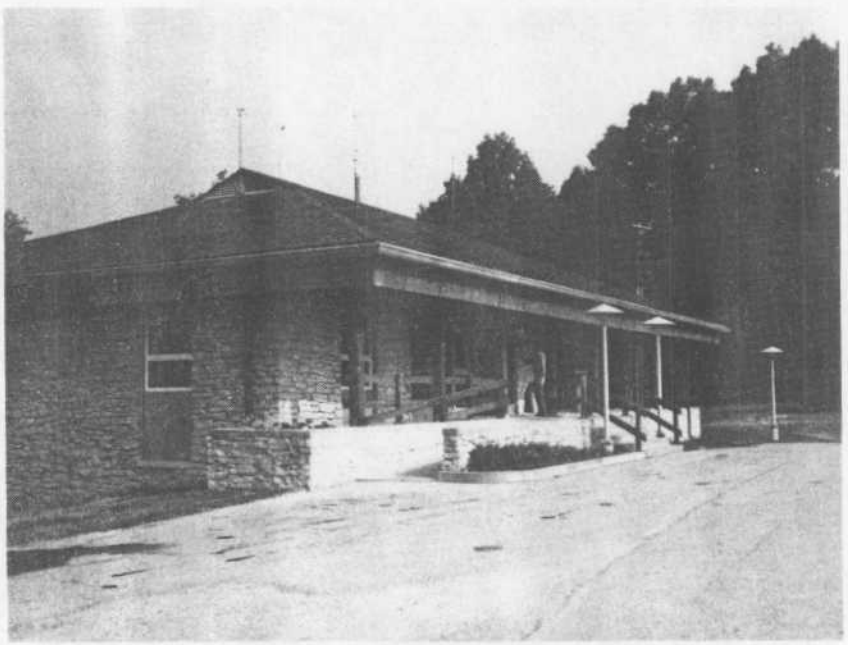

Figure 5-2 Access Ramp to Visitor Center